

Applicant: Lipponen et al.
Application No.: 10/559,598
Response to Office action dated Jun. 4, 2008
Response filed August 29, 2008

Remarks

Claims 71–84 remain pending in the application. In the Office action dated Jun. 4, 2008, claims 35–45, 48, 50–63, 67, and 70 were rejected under 35 U.S.C. 102(b) as being anticipated by Wallsten (US 4,102,299). Claims 35, 37–40, 50, 51, 56–59, 62–66, and 68 were rejected under 35 U.S.C. 102(b) as being anticipated by Mendez-Gallon (US 2002/0124796). Claims 35 and 45–47 were rejected under 35 U.S.C. 102(e) as being anticipated by Metzger et al (US 7,175,710). Claims 35–38, 50–53, 56–58, 60–63, and 66–68 were rejected under 35 U.S.C. 102(b) as being anticipated by Cleveland et al. (US 5,486,381). Claim 69 was rejected under 35 U.S.C. 103(a) as being unpatentable over Mendez-Gallon (US 2002/0124796) in view of Rantenen (CA 2376255). A rejection of claim 49 was inadvertently omitted.

The specification has been amended to properly refer to element 31b, as shown in FIGS. 5 and 6.

Claims 71–75 directed to the embodiment illustrated in FIG. 4 were allowed.

None of the references teach sizing a paper web with paper size, for example starch, by spraying the paper size to one side of the paper web, and a vacuum to the other side so the size penetrates the pores of the web.

Wallsten (US 4,102,299) teaches coating a paper web followed by on the same side which is coated applying a vacuum as a smoothing means to regulate the final thickness of the coating. In *Wallsten* first the coating is applied, then vacuum is applied to the same side.

Mendez-Gallon (US 2002/0124796) teaches applying a vacuum to a paper web and applying a curtain of coating to the opposite side, wherein the vacuum is applied by a vacuum roll or a vacuum box and the vacuum is applied before and after the coating is applied. *Mendez-Gallon* discloses a pigment, not a size, and does not show the pigment penetrating through the paper web. Further, the purpose of the vacuum is to get the curtain of coating to uniformly wet the web “so that all particles, irregularities, pores and the like on or in the material web are reliably covered with the application medium” [0010]. The teaching of *Mendez-Gallon* is limited to curtain coating, not spray application of size.

Metzger et al (US 7,175,710) teaches removing a boundary layer from the web with a

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suction box, which necessarily draws a vacuum on the pores of the web before applying a curtain of coating. *Metzger et al* is directed to problems of curtain coaters and the removal of the boundary layer.

Cleveland et al. (US 5,486,381) teaches a method of saturating a web by applying a curtain of saturant to an upper side of the web and substantially simultaneously applying a vacuum to the bottom side of about 15–67 kPa, the web is then passed to a dryer such as an infrared/impingement dryer. It is to be noted that *Cleveland et al.* also deals with a curtain applicator where sheet bulk is important, and no method of applying the coating except a substantially laminar flowing curtain of liquid is described.

New claim 76 is directed to the embodiment illustrated in FIG. 1

New claim 77 is directed to the embodiment illustrated in FIG. 7, note paragraph [0044] refers back to FIGS. 5 and 6 for examples of how coating in FIG. 7 may be applied, and paragraph [0041] indicates the spray technique may be used in FIGS. 5 and 6.

New claim 78 is directed to the embodiment illustrated in FIG. 3

New claim 76 is directed to the embodiment illustrated in FIG. 2

These claims distinguish over the prior art by claiming the application of paper size by spraying the paper size on to one side of the paper web, and applying a vacuum to the other side so the size penetrate the pores of the web. Claim 77 further adds drying with infrared or impingement dryer over the suction zone of the suction roll

New claims 80 and 81 are directed to the embodiment illustrated in FIGS. 9 and 10. Claim 80 distinguishes over the art of record by passing the web between two roll guide rolls, supported by a wire over three vacuum devices to draw surface size into the paper web. Claim 81 is further distinguished by the process of infrared or impingement drying between the first vacuum roll the second guide roll.

New claims 82 and 83 are directed to the embodiment illustrated in FIG. 11. Claim 82 distinguishes over the prior art of record in using three vacuum boxes and after the application of surface size the use of a curved vacuum box over a guide roll, after the application of surface size between two dryer rolls. Claim 83 further distinguishes by the

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process of infrared or impingement drying the second vacuum roll.

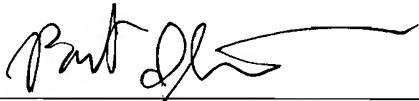
New claim 84 is directed to the embodiment illustrated in FIG. 12. Claim 84 distinguishes over the prior art of record by the use of a curved vacuum box over a guide roll, after the application of surface size, followed by passing the web to further treatment by a contact-free air turning device.

Applicant believes that no new matter has been added by this amendment.

Applicant submits that the claims, as amended, are in condition for allowance.

Favorable action thereon is respectfully solicited.

Respectfully submitted,



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August 29, 2008 (4:25pm)